



Speaker: Xiaoxiao Li
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4:00 PM

229 Hayes-Healy Hall

Title: Kähler-Einstein metrics on compact Kähler manifolds

Abstract:

In differential geometry, a basic problem is to find the "best" metric on a given manifold, and the most famous results are the geometrization theorems for 2 and 3-manifolds. For a compact n -dimensional Kähler manifold M , one of the candidates for the "best" metric would be the Kähler-Einstein metric, i.e. a Kähler metric whose Ricci form is a constant multiple of ω . Since the Ricci form represents the first Chern class $c_1(M)$, there are three different cases: $c_1 < 0$, $c_1 = 0$ and $c_1 > 0$. In renowned works in the 1970's, the "Calabi-Yau" case ($c_1 = 0$) was first solved by Yau and the negative case was settled independently by Aubin and Yau. The positive case was open for a long time and was just completely solved by Donaldson-Chen-Sun and Tian in 2013. In this talk I will focus on Yau's celebrated theorem. We will start with a very brief introduction to Kähler manifolds and then go into the Calabi's conjecture and Yau's proof. I will give the sketch of the proof and introduce the main ideas of the PDE methods that are used. Finally, time permitting, I will discuss the difficulties that arise in the positive case. Some basic knowledge of manifolds and analysis will be enough.